ಕರ್ನಾಟಕ ವಿಧಾನ ಪರಿಷತ್ತು

ಚುಕ್ಕೆ ಗುರುತಿಲ್ಲದ ಪ್ರಶ್ನೆ ಸಂಖ್ಯೆ	1093
ಸದಸ್ಯರ ಹೆಸರು	ಶ್ರೀ ಕೆ.ಎ.ತಿಪ್ಪೇಸ್ವಾಮಿ (ನಾಮನಿರ್ದೇಶನ ಹೊಂದಿದವರು)
ಉತ್ತರಿಸಬೇಕಾದ ದಿನಾಂಕ	22.12.2021
ಉತ್ತರಿಸುವ ಸಚಿವರು	ಕಂದಾಯ ಸಚಿವರು

ಕ್ರ. ಸಂ.	ಪ್ರಶ್ನೆ	ಉತ್ತರ
ಅ)	ರಾಜ್ಯ ಸರ್ಕಾರ ಕೇಂದ್ರ ಸರ್ಕಾರದ ಸರ್ವೆ ಅಫ್ ಇಂಡಿಯಾರವರ ಸಹಯೋಗದೊಂದಿಗೆ ರಾಜ್ಯದ 5 ಜಿಲ್ಲೆಗಳ ನಗರಗಳಲ್ಲಿ ಡ್ರೋನ್ ಆಧಾರಿತ ಭೂಮಾಪನಾ ಕಾರ್ಯ ವನ್ನು ಕೈಗೊಳ್ಳಲು ಒಡಂಬಡಿಕೆ ಪತ್ರಕ್ಕೆ ಸಹಿ ಮಾಡಿರುವುದು ನಿಜವೇ; ಹಾಗಿದ್ದಲ್ಲಿ, ಈ ಒಡಂಬಡಿಕೆ ಪತ್ರದ ನಕಲು ಮತ್ತು ಇತರೆ ಸಂಪೂರ್ಣ ಮಾಹಿತಿ ನೀಡುವುದು;	ಹೌದು. ಕರ್ನಾಟಕ ಸರ್ಕಾರ ಮತ್ತು ಕೇಂದ್ರ ಸರ್ಕಾರದ ಭಾರತೀಯ ಸರ್ವೇಕ್ಷಣಾ ಸಂಸ್ಥೆ ನಡುವೆ ರಾಜ್ಯದಲ್ಲಿ ಬೆಂಗಳೂರು ನಗರ ಸೇರಿದಂತೆ 5 ಜಿಲ್ಲೆಗಳಲ್ಲಿ ಡ್ರೋಣ್ ಸರ್ವೆ ಕಾರ್ಯದ ಕುರಿತು ಒಡಂಬಡಿಕೆ ಮಾಡಿಕೊಳ್ಳಲಾಗಿದೆ. ಪ್ರತಿಯನ್ನು **ಅನುಬಂಧ-1** ರಲ್ಲಿ ನೀಡಿದೆ.
ಆ)	ಈ ಯೋಜನೆಯ ಅನುಷ್ಠಾನ ಯಾವ ಹಂತದಲ್ಲಿದೆ; ಮತ್ತು ಯೋಜನೆ ಅನುಸಾರ ರೂಪಿಸಿರುವ ಮೈಲಿಗಲ್ಲುಗಳನ್ನು ಎಲ್ಲಾ ಜಿಲ್ಲೆಗಳ ನಗರಗಳಲ್ಲಿ ಸ್ಥಾಪಿಸಲಾಗಿದೆಯೇ; ಒಂದು ವೇಳೆ ಇಲ್ಲದಿದ್ದಲ್ಲಿ, ಮೈಲಿಗಲ್ಲುಗಳಿಂದ ಹಿಂದೆ ಬೀಳಲು ಕಾರಣಗಳೇನು; ಮತ್ತು ಕರಾರಿನ ಪ್ರಕಾರ ಉಭಯ ಪಕ್ಷಗಳ ಮೇಲೆ ವಿಧಿಸಬಹುದಾದ ದಂಡಗಳು ಯಾವುವು; ಇದಕ್ಕೆ ಕಾರಣೀಭೂತರು ಯಾರು ಯಾರು; (ಸಂಪೂರ್ಣ ಮಾಹಿತಿ ನೀಡುವುದು)	ಕರ್ನಾಟಕದಲ್ಲಿ 5 ಜಿಲ್ಲೆಗಳು ಸೇರಿದಂತೆ ಬೆಂಗಳೂರು ನಗರದಲ್ಲಿ ಭಾರತೀಯ ಸರ್ವೇಕ್ಷಣಾ ಸಂಸ್ಥೆಯ ಸಹಯೋಗದೊಂದಿಗೆ ಡ್ರೋಣ್ ಸರ್ವೆ ಕಾರ್ಯದ ಈ ಕೆಳಕಂಡ ಚಟುವಟಿಕೆಗಳನ್ನು ಕೈಗೊಳ್ಳಲಾಗುತ್ತಿದೆ;

ಡ್ರೋಣ್ ಸರ್ವೆ ಕಾರ್ಯದ ಮೈಲಿಗಲ್ಲುಗಳು:	ಕೈಗೊಳ್ಳಲಾದ ಕ್ರಮ
ಭಾರತೀಯ ಸರ್ವೇಕ್ಷಣಾ ಸಂಸ್ಥೆಯ ವತಿಯಿಂದ ರಾಜ್ಯಾದ್ಯಂತ 49 Continuously Operating Reference Station(CORS) ಸ್ಥಾಪನೆ-	ಪೂರ್ಣಗೊಂಡಿರುತ್ತದೆ.

		ಭಾರತೀಯ ಸರ್ವೇಕ್ಷಣಾ ಸಂಸ್ಥೆಯ High Precision Levelling (HP Levelling)- ರಾಜ್ಯದ ಸುಮಾರು 7400 ಕಿ.ಮೀ ಗಳಷ್ಟು HP Levelling	ಪೂರ್ಣಗೊಂಡಿರುತ್ತದೆ.	
		Drone Flying:	ಒಡಂಬಡಿಕಾ ಪತ್ರದ ಭಾಗವಾದ ಬೆಂಗಳೂರು ನಗರದಲ್ಲಿ ಸುಮಾರು 210 ಚ.ಕಿಮೀ ಗಳಿಗೆ Drone Flying ಪೂರ್ಣಗೊಂಡಿರುತ್ತದೆ. 5 ಜಿಲ್ಲೆಗಳಲ್ಲಿ ಪ್ರಥಮ ಹಂತದಲ್ಲಿ ರಾಮನಗರ ಮತ್ತು ತುಮಕೂರು ಜಿಲ್ಲೆಗಳಲ್ಲಿ Large Scale Mapping ನಲ್ಲಿ ಸುಮಾರು 11 ಗ್ರಾಮಗಳ Drone Flying ಕಾರ್ಯ ಕೈಗೊಳ್ಳಲಾಗಿತ್ತು. ಆದರೆ ರಾಜ್ಯದಲ್ಲಿ Covid-19 ನಿಂದಾಗಿ Lockdown, ಹವಾಮಾನ ವೈಪರಿತ್ಯ ಮುಂತಾದವುಗಳಿಂದಾಗಿ ನಿರೀಕ್ಷಿತ Drone Flying ಕಾರ್ಯಕ್ಕೆ ಅಡಚಣೆಯಾಯಿತು. ತದನಂತರದ ಹಂತವಾದ ಡ್ರೋಣ್ Flying ಚಟುವಟಿಕೆ ಯನ್ನು ಪ್ರಾರಂಭಿಸುವಷ್ಟರಲ್ಲಿ ಕೇಂದ್ರ ಸರ್ಕಾರದ ಮಹತ್ವಾ ಕಾಂಕ್ಷಿ ಯೋಜನೆಯಾದ ಸ್ವಮಿತ್ವ ಯೋಜನೆಯಡಿಯಲ್ಲಿ ಗ್ರಾಮೀಣ ಪ್ರದೇಶದ ಆಸ್ತಿಗಳ ಡ್ರೋಣ್ ಸರ್ವೆ ಕಾರ್ಯಕ್ಕೂ ಸಹ ಭಾರತೀಯ ಸರ್ವೇಕ್ಷಣಾ	

		ಸಂಸ್ಥೆಯವರೇ ಸಹಭಾಗಿತ್ವ ಹೊಂದಿರುವುದರಿಂದ ಕರ್ನಾಟಕ ರಾಜ್ಯದಲ್ಲಿ ಪ್ರಥಮ ಹಂತದಲ್ಲಿ ಸ್ವಮಿತ್ವ ಯೋಜನೆ ಡ್ರೋಣ್ Flying ಕಾರ್ಯ ಕೈಗೊಂಡು ತದನಂತರ Large Scale Mapping ಕಾರ್ಯ ಕೈಗೊಳ್ಳಲು ಕೇಂದ್ರ ಸರ್ಕಾರದಿಂದ ಸೂಚನೆ ಗಳಿರುವುದರಿಂದ ಈ 5 ಜಿಲ್ಲೆಯನ್ನೊಳಗೊಂಡಂತೆ ರಾಜ್ಯದಲ್ಲಿ ಸ್ವಮಿತ್ವ ಅಡಿಯಲ್ಲಿ 3,227 ಜನವಸತಿ ಪ್ರದೇಶದ ಡ್ರೋಣ್ ಸರ್ವೆ ಕಾರ್ಯ ಕೈಗೊಳ್ಳಲಾಗಿರುತ್ತದೆ. ಹಾಲಿ ಭಾರತೀಯ ಸರ್ವೇಕ್ಷಣಾ ಸಂಸ್ಥೆ ಯವರೊಂದಿಗೆ ಚರ್ಚಿಸಿ ಸ್ವಮಿತ್ವ ಸೇರಿದಂತೆ LSMK Drone Flying ಕಾರ್ಯವನ್ನು ಪ್ರಾರಂಭಿಸಲಾಗಿರುತ್ತದೆ. ಬೆಂಗಳೂರು ನಗರ ಮತ್ತು ರಾಮನಗರ ಜಿಲ್ಲೆಯಲ್ಲಿ Flying ಕಾರ್ಯ ಪ್ರಗತಿಯಲ್ಲಿರುತ್ತದೆ.
ಇ)	ಈ ಯೋಜನೆ ಅಡಿ ಆಯ್ಕೆಯಾಗಿರುವ ಕಿತ್ತೂರು-ಕರ್ನಾಟಕ ವಿಭಾಗದ ಜಿಲ್ಲೆಗಳಾದ ಬೆಳಗಾವಿ ಮತ್ತು ಉತ್ತರ ಕನ್ನಡ ಜಿಲ್ಲೆಗಳಲ್ಲಿನ ನಗರಗಳಲ್ಲಿ ಇದುವರೆಗೂ ಡ್ರೋನ್-ಸರ್ವೆ ಕಾರ್ಯ ಪ್ರಾರಂಭವಾಗದಿರುವುದು ನಿಜವೇ; ಹಾಗಿದ್ದಲ್ಲಿ, ಈ ಕಾರ್ಯವನ್ನು ಕೈಗೊಳ್ಳದಿರಲು ಪ್ರಬಲವಾದ ಕಾರಣ ಗಳೇನು: (ಸಮರ್ಥನೆಯೊಂದಿಗೆ ಸಂಪೂರ್ಣ ಮಾಹಿತಿ ನೀಡುವುದು)	ಡ್ರೋಣ್ ಆಧಾರಿತ ಭೂಮಾಪನ ಕಾರ್ಯದಲ್ಲಿ ಆಯ್ಕೆ ಮಾಡಲಾದ 5 ಜಿಲ್ಲೆಗಳಲ್ಲಿ ಬೆಳಗಾವಿ ಜಿಲ್ಲೆಯೂ ಸಹ ಒಂದಾಗಿದ್ದು, ಈ ಜಿಲ್ಲೆಯಲ್ಲಿ ಡ್ರೋಣ್ ಸರ್ವೆ ಕಾರ್ಯ ಚಟುವಟಿಕೆಗಳಾದ CORS ಸ್ಥಾಪನೆ ಮತ್ತು HP Leveling ಕಾರ್ಯವನ್ನು ಕೈಗೊಳ್ಳಲಾಗಿರುತ್ತದೆ. ತದನಂತರದ ಹಂತವಾದ ಡ್ರೋಣ್ Flying ಚಟುವಟಿಕೆಯನ್ನು ಪ್ರಾರಂಭಿಸುವಷ್ಟರಲ್ಲಿ ಕೇಂದ್ರ ಸರ್ಕಾರದ ಮಹತ್ವಾಕಾಂಕ್ಷಿ ಯೋಜನೆಯಾದ ಸ್ವಮಿತ್ವ ಯೋಜನೆ ಯಡಿಯಲ್ಲಿ ಗ್ರಾಮೀಣ ಪ್ರದೇಶದ ಆಸ್ತಿಗಳ ಡ್ರೋಣ್ ಸರ್ವೆ ಕಾರ್ಯಕ್ಕೂ ಸಹ ಭಾರತೀಯ ಸರ್ವೇಕ್ಷಣಾ ಸಂಸ್ಥೆಯವರೇ ಸಹಭಾಗಿತ್ವ ಹೊಂದಿರುವುದರಿಂದ ಕರ್ನಾಟಕ ರಾಜ್ಯದಲ್ಲಿ ಪ್ರಥಮ ಹಂತದಲ್ಲಿ ಸ್ವಮಿತ್ವ ಯೋಜನೆ ಡ್ರೋಣ್ Flying ಕಾರ್ಯಕೈಗೊಂಡು ತದನಂತರ Large Scale Mapping ಕಾರ್ಯ ಕೈಗೊಳ್ಳಲು ಕೇಂದ್ರ ಸರ್ಕಾರದಿಂದ

		ಸೂಚನೆಗಳಿರುವುದರಿಂದ ಈ ಜಿಲ್ಲೆಯಲ್ಲಿ ಸ್ವಮಿತ್ವ ಅಡಿಯಲ್ಲಿ 92 ಜನವಸತಿ ಪ್ರದೇಶದ ಡ್ರೋಣ್ ಸರ್ವೆ ಕಾರ್ಯ ಕೈಗೊಳ್ಳಲಾಗಿರುತ್ತದೆ. ಭಾರತೀಯ ಸರ್ವೇಕ್ಷಣಾ ಸಂಸ್ಥೆಯವರೊಂದಿಗೆ ಚರ್ಚಿಸಿ ಸ್ವಮಿತ್ವ ಸೇರಿದಂತೆ LSMK ಕಾರ್ಯವನ್ನು ಪ್ರಾರಂಭಿಸಲಾಗಿರುವುದರಿಂದ, ಈ ಜಿಲ್ಲೆಯಲ್ಲೂ ಸಹ ಹಂತಹಂತವಾಗಿ Flying ಕಾರ್ಯ ಕೈಗೊಳ್ಳಲಾಗುತ್ತಿದೆ.
ಈ)	ಈ ಯೋಜನೆಯಡಿ ಕೇಂದ್ರ ಸರ್ಕಾರದಿಂದ ದೊರೆತಿರುವ ಆರ್ಥಿಕ ಮತ್ತು ಇತರೆ ನೆರವು ಎಷ್ಟು; ಈ ನೆರವನ್ನು ಯಾವ ವಿಧದಲ್ಲಿ ರಾಜ್ಯ ಸರ್ಕಾರದ ವೆಚ್ಚದೊಂದಿಗೆ ವಿನಿಯೋಗಿಸಲಾಗಿದೆ? (ಜಿಲ್ಲಾವಾರು ಮತ್ತು ನಗರವಾರು ಸಂಪೂರ್ಣ ವಿವರ ನೀಡುವುದು)	ಕೇಂದ್ರ ಸರ್ಕಾರವು DILRMP (Digital India Land Records Modernization programme) ಅಡಿಯಲ್ಲಿ 2013 ರಲ್ಲಿ ರೂ 24.51 ಕೋಟಿ ಅನುದಾನವನ್ನು ಬಿಡುಗಡೆಗೊಳಿಸಲಾಗಿರುತ್ತದೆ. ಈ ಮೊತ್ತದಲ್ಲಿ ಕರ್ನಾಟಕ ರಾಜ್ಯದಲ್ಲಿ ಬೆಂಗಳೂರು ನಗರ ಸೇರಿದಂತೆ 5 ಜಿಲ್ಲೆಗಳಲ್ಲಿ ಡ್ರೋಣ್ ಸರ್ವೆ ಕಾರ್ಯದ ಒಟ್ಟು ಮೊತ್ತವಾದ ರೂ 76.00 ಕೋಟಿಗಳ ಪೈಕಿ ರೂ 22.00 ಕೋಟಿಗಳನ್ನು ಭಾರತೀಯ ಸರ್ವೇಕ್ಷಣಾ ಸಂಸ್ಥೆಯವರಿಗೆ ಕರ್ನಾಟಕದಲ್ಲಿ ಡ್ರೋಣ್ ಸರ್ವೆ ಕಾರ್ಯಕ್ಕಾಗಿ ಪಾವತಿಸಲಾಗಿದೆ.

ಸಂಖ್ಯೆ: ಕಂಇ 231 ಎಸ್‌ಎಸ್‌ಸಿ 2021

(ಆರ್.ಅಶೋಕ)

ಕಂದಾಯ ಸಚಿವರು

ಅನುಬಂಧ-1

LCG - 1093

Memorandum of Understanding (MOU)

between

Government of India through Survey of India, Dehradun

and

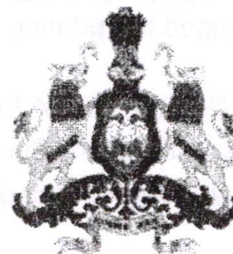
Government of Karnataka through Revenue Department, Survey, Settlement and Land Records, Bangalore

for

Drone Based Survey in Karnataka

Signed on this 28th Day of February 2019





Survey of India,
Department of Science & Technology,
Govt of India
Dehradun

Revenue Department
Survey, Settlement and Land Records,
Govt of Karnataka,
Bangalore

Memorandum of Understanding between Survey of India and Department of Survey, Settlement and Land Records, Bangalore

The MoU is made and entered into on 28th day of February month of year 2019

between

The President of India, acting through Surveyor General of India, Survey of India, Ministry of Science & Technology, Govt. of India, having office at Hathibarkala Estate, Dehradun-248001; hereinafter referred to as Survey of India (which expression shall, unless excluded by or repugnant to the context, be to include his successors in office . and assigns) of the First Part:

And

Government of Karnataka, Revenue Department, represented by Principal Secretary to the Government, Bangalore of the Second Part:

WHEREAS the Survey of India is the National Mapping & Surveying Agency engaged in Surveying and Mapping of whole country including Towns, Villages, Cities and States and in publishing topographical and general purpose maps in analogue and digital form.

AND WHEREAS, Survey of India is the owner of its analogue and digital map data and presently engaged in updating of topographical maps of Karnataka.

AND WHEREAS Department of Survey, Settlement and Land Records, Government of Karnataka has requested Survey of India (SoI) to undertake the large scale mapping of urban and rural areas of Bengaluru and various other Districts of the state.

Hence this Memorandum of Understanding as detailed herewith,

28/02/19

1 Background

Department of Survey Settlement and Land Records, Government of Karnataka (GoK) requires updation of their existing land records for Bengaluru and various other districts of their state. GoK approached Survey of India (SoI) to undertake the large scale mapping of urban and rural areas. It was proposed by Survey of India to carry out drone based survey of these areas for efficient and effective mapping output. A pilot project was carried out to check the accuracy, output and results of drone based survey at Jayanagar in Bengaluru city and Ramanagar town separately. The same was accepted and approved for going ahead for use of large scale survey for the State of Karnataka. Further, GoK expressed their interest in carrying the drone based survey in two phases. In first phase a total area of 51000 sq km has been proposed (1000 sq km for Bengaluru and adjoining areas and 50000 sq km for five districts in Karnataka). In phase 2 other towns/cities and districts will be taken up.

2 Scope and Area of Work

In Phase 1, Drone/UAV based survey of the rural and urban land and properties following Districts will be carried out:

a) Tumkuru

b) Hassan

c) Uttara Kannada

d) Belgavi

e) Ramnagar

f) Bangalore City

The total area to be covered in Phase1 is about 51000 sq km.

3 Methodology

3.1 High Resolution Digital Aerial Photographs using Survey/Mapping grade UAV/Drone:

Aerial photography of the area shall be carried out by the SOI using Professional Survey Grade UAV/ Drone for Large Scale Mapping consisting of onboard

kinematic GNSS and IMU. The flight plan shall be so designed as to have requisite spatial resolution and sufficient overlap (forward/lateral) essentially required for raw data processing, Ortho-Image generation and DEM generation for all height measurements.

3.2 Horizontal & Vertical Ground Control Points (GCPs):

3.2.1 Establishment of Continuously Operating Reference Station (CORS) Network: A network of CORS base stations forming a closed network will be established across the State of Karnataka for speedier execution of the project first. CORS network broadcasts corrections, usually over an Internet connection and a GPS rover in the network uses this correction to give precise positioning on ground within very less time of the order of 30-60 seconds. Accuracy of observed position within the CORS network is very good, as more than one base station ensures precise positioning and guards against a false initialization with single base station.

Ground Control Points (GCPs) shall be provided using this CORS network for all purposes in the project.

3.2.2 Leveling Network Establishment: All CORS stations will be connected with DT Leveling based on SoI Bench-Marks. Further densification of leveling network will be done as per the vertical or height control requirements in project.

3.3 Block Control &Adjustment - IMT/ AT/ DEM Generation:

DEM and Ortho-rectified image (ORI) shall be generated from digital aerial photographs (obtained from Professional Survey Grade Unmanned Aerial Vehicle/ Drone for Large Scale Mapping), GCPs and onboard (UAV) GNSS & IMU using image matching techniques and analytical photogrammetric methods on software.

3.4 Base Map Generation & 2D Feature Extraction:

3.4.1 The ortho-rectified image, after data/image (obtained from Professional Survey Grade Unmanned Aerial Vehicle) processing, shall act as a base map from which topographical and man-made (visible) features shall be extracted. Features not visible in the images shall be picked from ground via soft GPS survey/ ETS survey.

3.4.2 Features such as administrative boundaries, land parcel information, revenue boundaries etc (which cannot be derived from topographical base map as mentioned in pt 3.4) shall be derived from the cadastral maps/blueprints (maintained by State Nodal Agency(SNAs) of GoK). These softcopy of the

maps shall be derived from the SNAs official records/maps/blueprints which shall then be geo-referenced w.r.t. the GCPs under close coordination and supervision of SNAs.

3.4.3 2D Feature Extraction:

2D topographical feature extraction shall be derived from Ortho-rectified images (as per point no. 3.4) and digitised cadastral maps/blueprints (as per point no. 3.4.1) using GIS software. The base map shall comprise various layers in GIS format as per the requirements of the project. (As defined by SNA in consultation with SoI)

OGC (open Geospatial Consortium) compliant GIS database models shall be implemented for generation of GIS layer data structure for storing spatial & attribute data. The fineness of features to be extracted depends on the deliverables/ wish list provided by the respective SNAs.

4 Deliverables

a) Large Scale maps on 1:500 scale in UTM/WGS-84for village for urban and rural areas (Hard Copy outputs of Draft & Final village Maps: 01 set each)

b) Horizontal Accuracy = 12.5 cm; Vertical Accuracy = 50 cm

c) Ortho-Rectified Image (ORI) tiles of better than 10 cm GSD.

d) Seamless digital database with all layers as per data model specified. (Data base in Post-Gre/Oracle data structure as per indenter's requirement; Data in open file formats like *.shp or other format as per requirement)

e) Control data with co-ordinates and sketch of the control points.

f) Spatial and non-spatial data dictionary with feature codes, feature type (line, points and polygon).

g) Feature description and symbols.

h) The use of open standards is mandatory for data sharing and inter-operability among different systems.

i) Metadata of features.

5 Time Schedule

The following activities are involved in the project:

a) Provision of Ground Control Points (GCPs) through CORS, along with the Heights.

b) Aerial Photography using Survey/Mapping grade Drone.

c) Data Processing, Block Control & Adjustment- IMT/AT/DEM Generation and **Ortho photo Generation**
d) Feature Extraction
e) Delivery of Deliverables and misc cost (including cost of storage units, Field data processing unit, Scanner, Plotter and misc costs).

Total time taken to complete the project will be 17 months from the date award of work as in Annexure-1

6 Financial Terms and Conditions

(A) Cost:

The total cost of the project is estimated to be Rs. 76 Crore. Both the parties understand and do agree that the actual cost of the project, worked out on the basis of the actual / total surveyed area in sq. kms and calculated after the completion of the project, will be borne by Government of Karnataka. Any activity in addition to the activities given in SoI proposal will be permitted to be undertaken under the project out of savings within the allocated fund of Rs 76.0 Cr to meet the objectives of this project.

(B) Release of Payment

a) Funds would be released by GoK in phased manner as worked out in the MoU.
b) SoI would open a **Civil Deposit account** for this project with Government of India and funds released by GoK would be placed in such deposit account for making all payments towards expenditure incurred in the project.
c) SoI would require advance payment as agreed in MoU for kick-starting the project.

No Salary cost and overhead charges would be charged by the SoI towards the services of SoI personnel or officers in various capacities in execution of the project. No additional cost for QA/QC work by SoI will be charged. No additional cost for Capacity building of GoK or otherwise by SoI will be charged.

7 Government of Karnataka Obligations

a) Feature layers & types other than land parcels to be incorporated in hard copy and soft copy deliverables will be finalized by SoI in consultation with the State Government.

b) Digital land records or land parcel maps digitized from existing records for updating and integration, as applicable.

c) GoK agrees and acknowledges that export of Survey of India maps on 1:250,000 and larger scales is prohibited. For export of publications having Survey maps on 1:250,000 scale and large scales, special permission shall always be obtained from the Ministry of External Affairs, Department of Revenue and Ministry of Defense through Survey of India.

d) The data/map supplied by Survey of India to GoK will be used by GoK for official use and strictly as per Government procedure and terms and conditions.

8 Joint Responsibility

Project Monitoring & Execution mechanism will comprise two tiers. A Project Steering Committee (PSC) will be constituted under the Chairmanship of SGI for overall monitoring at headquarter level and a Technical Project Implementation Committee(TPIC) will be constituted at State level under Director, Karnataka GDC (SoI), Bengaluru and members from GoK for the technical execution of the project. Additionally the administrative execution of the project shall be by Administrative Project Implementation Committee (APIC) under Commissioner Survey, Settlement and Land Records, GoK and shall have members from Survey of India.

9 Survey of India Liability

a) The technical part of the project will be executed within SoI premises under close supervision of SoI. In case of outsourcing of the Feature Extraction (F.E.) work, QA/QC at all stages including pari-pasu examination will be carried out by SoI only.

b) Activities given in sl. 3.1, 3.2, 3.3 and 3.4 will be outsourced wherever adequate SoI manpower is not available to complete the work in given timeline. As far as data acquisition, ground control provisioning and QA/QC (including Supervision) is concerned, it will be exclusively done by SoI. Activities mentioned in Sl 3.4.1, 3.4.2 and 3.4.3 will be executed by SoI with close supervision of SNAs

c) To the extent it is feasible, SoI will deploy maximum resources for these activities on priority.

d) All mentioned above including Project planning, preparation of bid/RFP, bid processing, award of work, work execution as per contract etc. would be done by SoI and shall adhere with the norms as laid by Government of India.

10 Arbitration

In the event of any dispute or difference relating to the interpretation and application of provisions of this MoU, such dispute or difference shall be referred by either Party for Arbitration to the Sole Arbitrator nominated by the Secretary to the Govt. of India Department of Science and Technology in consultation with the Government of Karnataka. The Arbitration and Conciliation Act 1996 and the Arbitration and Conciliation Act 2015 shall not be applicable to arbitration under this clause. The Award of arbitrator shall be binding upon the Parties to the dispute, provided, however, any party aggrieved by such Award may make a further reference for setting aside or revision of the Award to the Law Secretary, Dept. of Legal Affairs, Ministry of Law and Justice, Govt. of India. Upon such reference, the dispute shall be decided by the Law Secretary or the Special Secretary/Addl. Secretary, when so authorized by the Law Secretary, whose decision shall bind the parties finally and conclusively. The Party to the Dispute will share equally the cost of Arbitration as intimated by the Arbitrator.

11 Indemnity

Each party shall indemnify and hold harmless the other party and its trustees, officers, employees from and against any claims, actions, damages, expenses (including reasonable fees and costs), liabilities and costs arising from or relating to the services of either party under this Agreement.

12 Relationship Principal to Principal

All dealings between Survey of India and Department of Survey Settlement and Land Records, Government of Karnataka shall be as Principal to Principal. This MoU does not in any way create, establish or deem to imply the relationship of principal and Agent or partnership between Survey of India and Department of Survey Settlement and Land Records.

13 Force Majeure

Neither party shall be held responsible for non-fulfillment of its respective obligations under this MoU to the exigency of one or more of the force majeure events lying beyond the responsible control of affected Party, such as but not limited to, Acts of God, War, Flood, Earthquakes, Epidemics, Riots, Civil commodities etc. provided on the occurrence and cessation of any such events, the party affected thereby shall a notice in writing to this effect to the other party immediately after, but not later than one month of such occurrence and/or cessation. The period between the occurrences and cessation of such events will be excluded while calculating the period during which the party has to perform its obligations under this MoU. If the force majeure conditions continue beyond six months, the parties shall then mutually decide about the future course of action.

14 Governing Law and Jurisdiction

This MoU shall be governed by and constructed in accordance with Indian laws.

15 **Miscellaneous:** The Survey of India and Government of Karnataka represented by Commissioner Survey, Settlement and Land Records can mutually together add or modify or amend this MoU with an aim to ensure better and expeditious delivery of the objectives of this project.

16 **Project Team from Government of Karnataka and Survey of India**

A) Technical Project Implementation Committee

1. Director Survey of India KGDC Bangalore
2. Commissioner Survey, Settlement & Land Records.
3. Officer from Survey of India (to be nominated)
4. Joint Director UPOR
5. Smt.J Vijaybhawani. I/c Joint Director of City Survey South Zone Bangalore.
6. Sri Rudresha. K.V consultant, BMC Bangalore
7. Any member as mutually agreed upon

B) Administrative Project Implementing Committee, Revenue Department, GoK

1. Commissioner Survey, Settlement & Land Records.
2. Sri D Sahoo Deputy Director Survey of India KGDC Bangalore
3. Sri Y.K.Rathod Officer Surveyor, Survey of India. KGDC Bangalore.
4. Joint Director UPOR
5. Smt.J Vijaybhawani. I/c Joint Director of City Survey South Zone Bangalore.
6. Sri Rudresha. K.V consultant, BMC Bangalore
7. Any member as mutually agreed upon

28/02/2019

Lt Gen Girish Kumar,
Surveyor General, Survey of India
Department of Science & Technology,
Govt of India
Dehradun

28/02/2019

Dr: Rajkumar Khatri I.A.S
Principal Secretary to the Government,
Revenue Department
Govt of Karnataka
Bangalore

Annexure-1

Time Schedule with Detailed Costing

Sl no	Activity	Area	Time line	Unit Cost	Cost
	Award of work		'D' day		
1	Establishment of Ground Control Points (GCPs)through CORS	60 stations	D+ 03 months	20 Lakhs	12.00 Cr
2	(a) Leveling (Height of GCP) (Double Tertiary) ** instruments to be used – Digital Level	60 stations	D+03 months		1.61 Cr
3	GPS observation of GCPs (Dual frequency)	40 (Nos of rovers)		2.5	1 Cr
4	Acquisition of Aerial Photographs using survey/ mapping grade drone /UAV (40 teams will be working concurrently)	51000 Sq km	(9 months) D + 12 months (parallel activity)		13.3 Cr
5	Data processing with help of high end computer,Block Control & Adjustment – IMT/ AT/DEM Generation and Ortho Photo Generation	51000 Sq km	(13 months) D + 16 months (parallel activity)		18.3 Cr
6	2D Feature Extraction	51000 Sq km	11 months D + 16 months (parallel activity)		22.95 Cr
7	Delivery of Deliverables and misc cost(including cost of storage units, Field data processing unit, Scanner, plotter and misc costs)		1 months	10% of total cost of all above components	
	Total Cost				**76 Cr**

1. Salary component of the SoI personnel has not been incorporated in the above calculations.

2. No additional cost for QA/QC work by SoI has been charged in total cost.

3. No additional cost for Capacity building by SoI has been charged in total cost.